

ACTINIARIA AND CORALLIMORPHARIA

BY

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WITH TWENTY-EIGHT TEXT-FIGURES.

OUR knowledge of the Actiniaria and Corallimorpharia of the Great Barrier Reef is based on the works of Saville-Kent (1893, 1897) and of Haddon (1898). Saville-Kent unfortunately describes and figures only the external features of his species; and the descriptions made by Haddon of the forms from the adjacent tropical waters of the Torres Straits are also rather incomplete, though he gives some notes about their anatomy. Undoubtedly, however, the waters from New Guinea to southern Queensland have most of their genera and a number of species in common. The collection examined by me contains the two species of Corallimorpharia and twenty-two of Actiniaria which are listed below; but Stephenson (1931, p. 47) mentions also *Thalassianthus* (?) *hypnoides* Sav.-Kent, and in a letter to me *Actinaria dendrophora* Hadd. & Shackl., which according to him are probably identical species.

ACTINIARIA.

Edwardsia stephensoni n. sp.
Edwardsia gilbertensis Carlgr.
Charisella annulata (n. gen.), n. sp.
Triactis cincta (Hadd. & Shackl.).
Isactinia ignota n. sp.
Isactinia lobata n. sp.
Gyrostoma hertwigi Kwietn.
Actinodendron plumosum Hadd.
Phymanthus muscosus Hadd. & Shackl.
Heteranthus verruculatus Klunz.
Heterodactyla hemprichii Ehr.
Cryptodendrum adhesivum Klunz.
Stoichactis Kenti (Hadd. & Shackl.).

Stoichactis haddoni (Saville-Kent).
Hormathianthus tuberculatus Carlgr.
Calliactis miriam (Hadd. & Shackl.).
Telmatactis stephensoni n. sp.
Telmatactis australiensis n. sp.
Telmatactis insignis n. sp.
Epiphellia anneae (n. gen.), n. sp.
Epiphellia elongata n. sp.
Anthothoë australiensis n. sp.

CORALLIMORPHARIA.

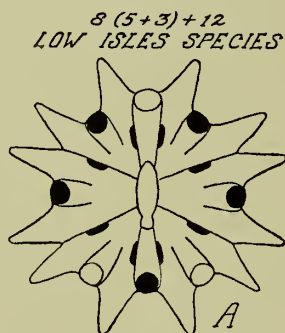
Rhodactis Howesii Saville-Kent.
Rhodactis (*Actinotryx*) *bryoides* (Hadd. & Shackl.).

ACTINIARIA.

Fam. EDWARDSIIDAE.

Edwardsia stephensoni n. sp.

Nemathybomes scattered, rather small. Tentacles usually 20, arranged in three cycles, $5 + 3 + 12$. The ventral directive tentacle belongs to the first cycle, the dorsal directive tentacle to the second cycle. Retractors of the macrocnemes strong but diffuse, with numerous folds which are high and branched, especially in their outermost parts. The outer, lamellar part of the macrocneme is attached to the retractor far from its edge. Parietal muscles elongate, forming many fine folds. The extension of the parietal muscles on the column is considerable. Nematocysts of the nemathybomes $36-46.5 \times 2.8-3\mu$; those of the tentacles (14) $17-29.6 \times 2.2-3.5\mu$, basitrichs; those of the actinopharynx partly $15.5-22.6 \times 2.2-2.8\mu$, partly $25.1-38 \times 3-4.2\mu$, both basitrichs; those of the



TEXT-FIG. 1.—*Edwardsia stephensoni* n. sp. First cycle of endocoelic tentacles, black spots; second cycle circles. (After Stephenson; reproduced by permission of the Ray Society).

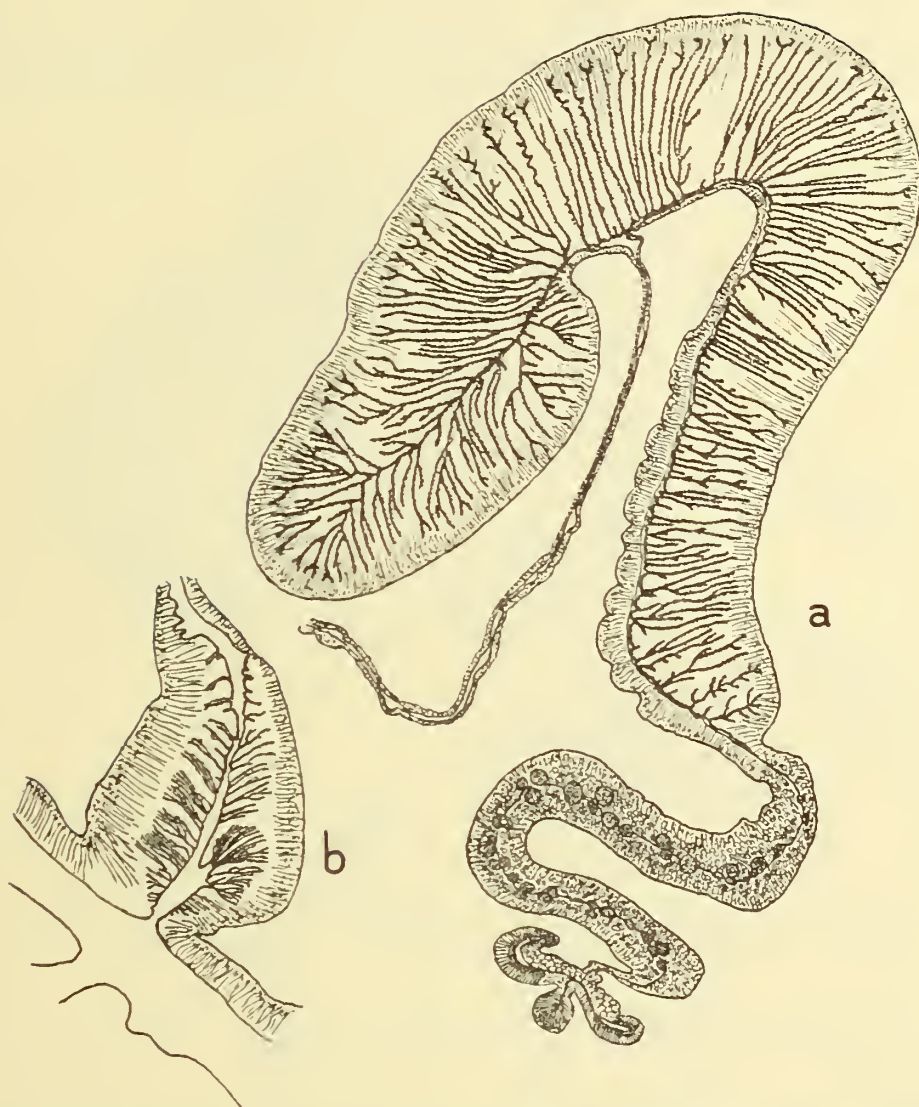
filaments partly $22.6-32.4 \times 4.2-5.6\mu$, microbasic *p*-mastigophors, partly $24-37 \times 3.5-4.5\mu$, partly $12.7-24 \times 2.8\mu$, both basitrichs.

COLOUR in the preserved condition.—Tentacles of one specimen green.

SIZE of a large specimen, in introverted condition.—Length 8 cm., greatest diameter 0.8 cm.

OCCURRENCE.—Low Isles, 23.viii.28, 2 specimens; 10.iv.29, 5 specimens; central flat, 22.viii.28, 1 specimen.

This species is related to *Edwardsia duodecimtentaculata* (Carlgren, 1931, p. 4), but the arrangement and number of tentacles is not the same as in that species. Professor T. A. Stephenson made a sketch from the living animal showing the arrangement of the tentacles; this is reproduced here as Text-fig. 1. Text-fig. 2 shows sections of a retractor (a) and of a parietal muscle (b), both taken from a macrocneme in the uppermost part of the fertile region. The nematocysts were examined in 5 specimens and show little variation from one individual to another.

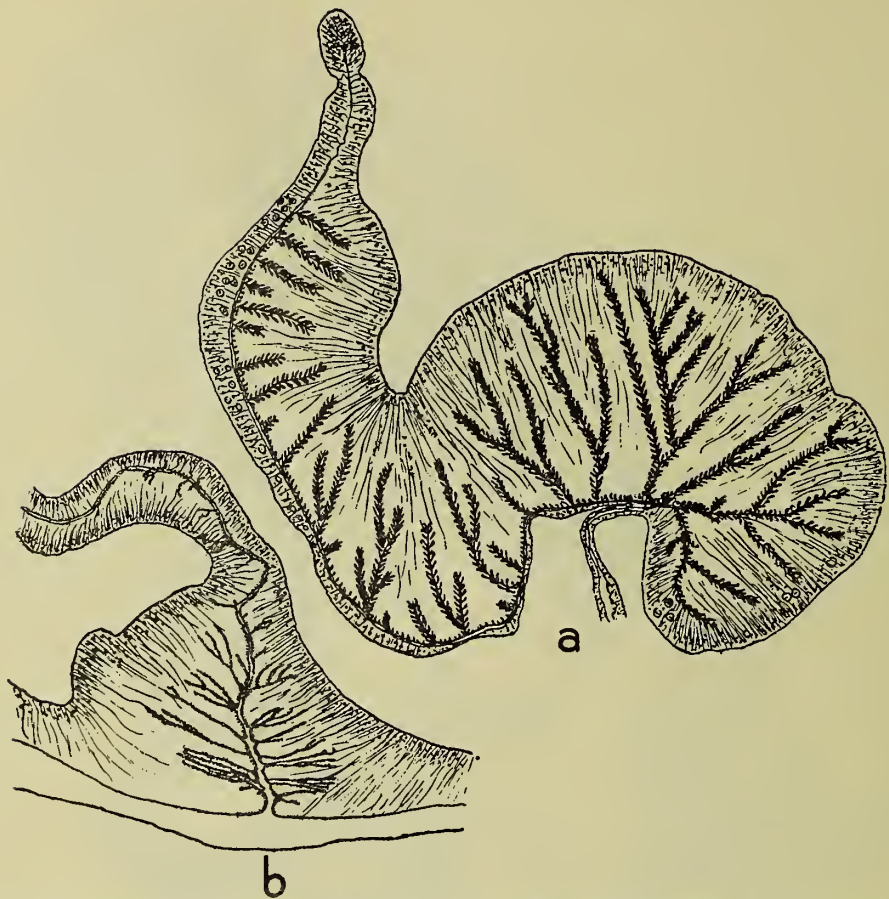


TEXT-FIG. 2.—*Edwardsia stephensoni* n. sp. Transverse sections of (a) retractor muscle and (b) parietal muscle from a macrocneme in the uppermost part of the fertile region.

Edwardsia gilbertensis Carlgr.

Edwardsia gilbertensis Carlgren, 1931, p. 10, figs. 7–9.

I have, with some hesitation, referred the present specimens of *Edwardsia* to *gilbertensis*. The body is strongly polygonal. The number of tentacles is 16–20, as in that species, and the retractors and parietal muscles agree rather well with those of *gilbertensis*. The nematocysts of the nemathybomes in the present specimens are somewhat longer, $38.1\text{--}49.3 \times \text{about } 28\mu$; those of the tentacles (11.3) $15.5\text{--}25.4 \times 2.2\text{--}2.8\mu$, basitrichs; those of the filaments partly $25.4\text{--}46.5 \times 5.6\text{--}7\mu$, microbasic p-mastigophors, partly $28.2\text{--}38.1 \times 4.2\text{--}5.6\mu$, partly $14\text{--}26 \times 2.2\text{--}2.8\mu$, both basitrichs. Three specimens from different localities were examined for nematocysts. The endoderm is provided with numerous zooxanthellae.



TEXT-FIG. 3.—*Edwardsia gilbertensis* Carlgren (?). Transverse sections of (a) retractor muscle and (b) parietal muscle at the level of the uppermost part of the cnido-glandular tract.

SIZE of the largest specimen in introverted condition.—Length 4 cm., greatest diameter 0.4 cm.

OCCURRENCE.—Low Isles, 23.viii.28, 2 specimens; 10.iv.29, 1 specimen; 20.iv.29, several specimens. Further distribution: Tapetoca, Taritari or Apaiang, Key Islands.

Text-fig. 3 shows sections of a retractor (a) and a parietal muscle (b) at the level of the uppermost part of the cnido-glandular tract.

Fam. CONDYLANTHIDAE.

Genus *Charisella*.

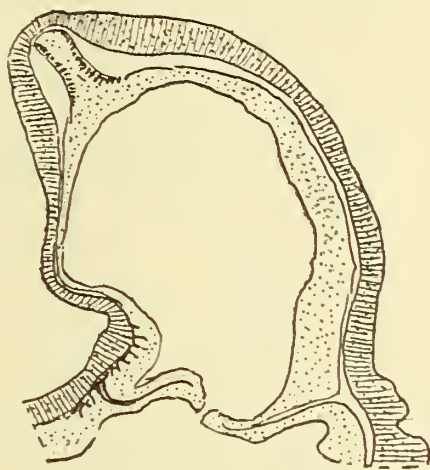
Charisella n. gen., Carlgren, 1949, p 46.

Condylanthidae with elongate, cylindrical column not divisible into regions, smooth. At the margin a ring of pseudospherules. Sphincter endodermal, diffuse, very weak. Tentacles about 48 in number, short, hexamerously arranged, their longitudinal muscles ectodermal. Two distinct siphonoglyphs. Mesenteries divisible into macro- and microcnemes. Two cycles of macrocnemes, one of microcnemes, the latter weak and thin. Cnidom: spirocysts, basitrichs, microbasic *p*-mastigophors.

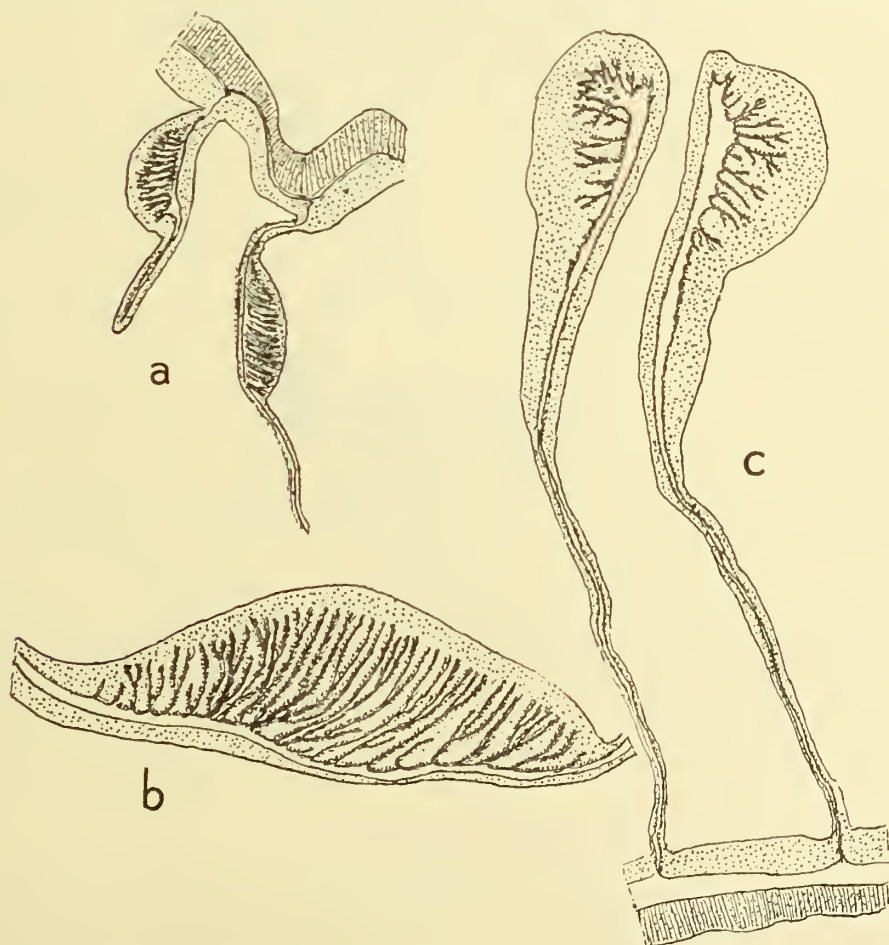
GENOTYPE.—

C. elongata n. sp.

Aboral end small. Column cylindrical, smooth, without a cuticle, provided at the margin with a ring of perforated pseudospherules. A very weak diffuse sphincter. Ten-

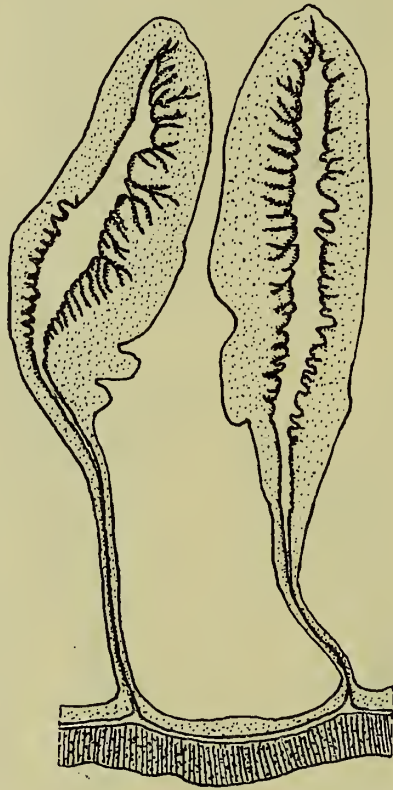


TEXT-FIG. 4.—*Charisella elongata* n. sp. Section of the uppermost part of the column.



TEXT-FIG. 5.—*Charisella elongata* n. sp. Cross sections of directive mesenteries. (a) Two directives with corresponding siphonoglyph. (b) A single directive. (c) Two directives near the base of the animal.

tacles about 48, short, their longitudinal muscles ectodermal. Actinopharynx with numerous high folds. Two distinct siphonoglyphs. Pairs of mesenteries 48; two pairs of directives. Mesenteries of the first and second cycles perfect and provided with retractors and filaments. Retractors of the mesenteries diffuse, somewhat restricted. Outer parts of the perfect mesenteries thin throughout, their muscles very weak. Near the base, the inner parts of the mesenteries are provided with longitudinal muscles on both sides. Microcnemes weak, thin. Basilar muscles distinct but rather weak. Number of mesenteries the same proximally and distally. Distribution of the gonads unknown. Nematocysts of the column $11.3-12.7 \times$ about 2.2μ , basitrichs, common; those of the



TEXT-FIG. 6.—*Charisella elongata* n. sp. Cross section of a pair of non-directive mesenteries near the base.

pseudospherules $5.6-10 \times$ about 1.4μ , basitrichs; those of the tentacles $12-14.1 \times$ about 2.2μ , basitrichs; those of the actinopharynx partly $18.3-21.1$ (22.6) \times $2.8-3.5\mu$, basitrichs, common, partly $16.9-20 \times 4.2$ (4.9) μ , microbasic *p*-mastigophors; those of the filaments partly $25.4-31 \times 2.8-3\mu$, common, partly $12.7-14.1 \times 2.2-2.5\mu$, few, both basitrichs, partly (16.2) $18.3-21.1 \times 3.5-4\mu$, microbasic *p*-mastigophors.

SIZE of the longer specimen.—Length about 2.5, cm. diameter 0.7 cm.; of the smaller: length 1.7 cm., diameter 0.6 cm.

OCCURRENCE.—Low Isles, 10.iv.29, 2 specimens.

Text-fig. 4 shows a section of the uppermost part of the column. The section has cut a marginal spherule, which is provided at its opening (not visible) with strong muscles. On the left the trace of a sphincter is visible; this, however, is weaker on other slides. The mesenteries of the second cycle are attached to the actinopharynx only in its oral

part. Their filaments are considerably shorter than those of the mesenteries of the first cycle. I have drawn cross-sections of mesenteries in Text-figs. 5 and 6. Text-fig. 5a shows 2 directives with the corresponding siphonoglyph; 5b a directive mesentery; 5c two directives near the base of the animal, Text-fig. 6 a pair of non-directives near the base. The basilar muscles are weak, but certainly present. There are numerous zooxanthellae in the endoderm.

Fam. ALICIIDAE.

Triactis cincta (Hadd. & Shackl.).

Viatrix cincta n. sp., Haddon & Shackleton, 1893, p. 127.

Hoplophoria cincta (Hadd. & Shackl.), Haddon, 1898, pl. xxiii, figs. 11–15.

Phyllodiscus cinctus Hadd. & Shackl., Stephenson, 1922, p. 280; Stephenson and others, 1931, p. 38; Carlgren, 1940, p. 31, fig. 82.

Triactis cincta (Hadd. & Shackl.), Carlgren, 1945, p. 7, 1947, p. 14.

? *Phyllodiscus indicus* n. sp., Stephenson, 1921, p. 561, fig. 18.

? *Triactis producta* n. sp., Klunzinger, 1877, p. 85, pl. vi, fig. 8.

The pedal disc is well developed. The column is smooth, but around its middle there is a ring of outgrowths, each consisting of a peduncle which is ramified distally. The smallest specimens (3 mm. long) have no outgrowths, slightly larger ones have about 12 sparsely placed outgrowths. With increasing size new outgrowths are intercalated between the older ones so that finally a ruff-like circle of very close-set outgrowths is formed. On the peduncle (but not on the branches) large vesicles are present which may also be developed on the disal part of the column close to the peduncle. Usually the vesicles, which are provided with macrobasic amastigophors, are set at the end of the peduncle close to the branches; but often they are present also at its base. The upper part of the column (the capitulum), above the outgrowths, is more thin-walled than the lower part, and somewhat narrower just above them and has ectodermal muscles and groups of spirocysts. The tentacles are hexamerously arranged and up to 48 in number. They are rather long, and provided with spots which are elongated transversely and therefore give the tentacles an annulate appearance. The spots contain numerous spirocysts and less numerous nematocysts. The siphonoglyphs are rather distinct. There are 6 pairs of perfect mesenteries and up to 18 pairs imperfect; two pairs are directives. The retractors are weak, diffuse, with low folds; the parietobasilar muscles very weak, forming a straight lamella. The specimens are seemingly sterile. As in *Phyllodiscus* and *Lebrunia*, the peduncles are provided with longitudinal muscle bands in the endoderm; but they are very weak here, and there do not appear to be more than 4 in each peduncle. As to the distribution and types of the nematocysts, see Carlgren, 1945, p. 7.

According to Stephenson (1931) the species stings the fingers quite badly. The tentacles are usually kept partially or completely retracted in strong light, whereas the ruff of vesicles is widely expanded. In a dim light the reverse was the case. Text-fig. 18, given by Stephenson, (1921), of *Phyllodiscus indicus*, gives a good idea of the external feature of *Triactis cincta*.

COLOUR.—Vesicles brown, tentacles bluish white, during life (Stephenson).

SIZE of a large specimen.—Length about 1.5 cm., diameter 0.8 cm.

OCCURRENCE.—Low Isles, sandy pools, 19.iv and 22.iv.29, numerous specimens. It is possible that *T. cincta* is identical with *T. producta* Klunz., from the Red Sea (see Carlgren, 1947, p. 14).

Fam. ACTINIIDAE.

Isactinia ignota n. sp.

Anemonia citrina Hadd. & Shackl., Stephenson and others, 1931, p. 57.

The pedal disc is well developed, the column smooth, provided at the margin with a ring of well developed perforated pseudospherules. Upper part of the column and outer

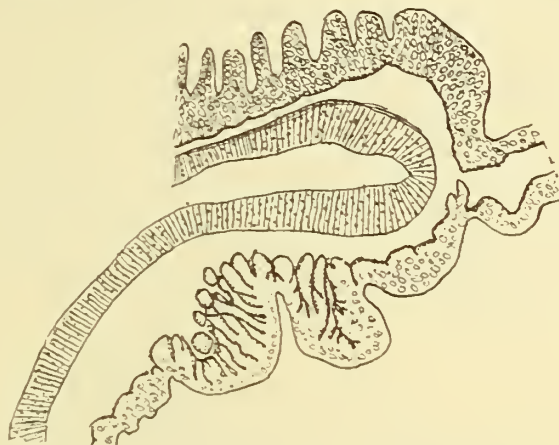


TEXT-FIG. 7.

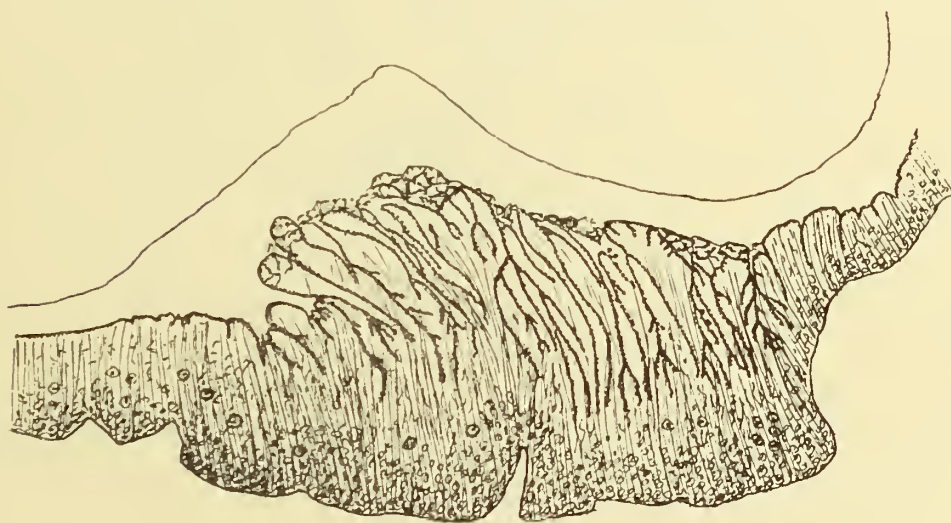


TEXT-FIG. 8.

part of the oral disc lobed in full-grown individuals. Sphincter somewhat restricted with rather long folds which are usually weaker in its middle part. The tentacles are of moderate length, in the older specimens numerous; their longitudinal muscles are ectodermal. There are considerably more tentacles than there are mesenteries at the limbus. The actinopharynx is folded, with 0-2 siphonoglyphs. At least 12 pairs of mesenteries are perfect. No directives, or 1-2 pairs. All stronger mesenteries are fertile. The retractors are band-like but not strong, the parietobasilar muscles weak,



TEXT-FIG. 9.



TEXT-FIG. 10.

TEXT-FIGS. 7-10.—*Isactinia ignota* n. sp. Sphincters of four specimens.

forming a single lamella on a fold of the mesentery. The nematocysts of the column are $18.3-26 \times 2.5-3\mu$, basitrichs; those of the pseudospherules $18.3-25.4 \times 2.5-3\mu$, basitrichs; those of the tentacles $14.1-19.7 \times 2.8-3.5\mu$, basitrichs; those of the actinopharynx partly $16.8-22.6 (24) \times 2.8-3.5\mu$, basitrichs, partly $16.9-21.8 \times 4.2-5.6\mu$, microbasic *p*-mastigophors rare; those of the filaments partly $27-32.4 \times (2.5) 3-4.2\mu$, partly $14-19 \times 2.8\mu$ scarce, both basitrichs, partly (14) $16-22.6 \times 4.2-5.6\mu$, microbasic *p*-mastigophors.

COLOUR of the largest specimen (collected 22.iii.29) in the preserved condition, green; probably in connection with the presence of zooxanthellae in the endoderm. The specimens collected 1.ix.28 were greyish black when preserved.

SIZE of the largest specimen.—Pedal disc 2 cm., column (contracted) 3 cm., oral disc 3 cm.

OCCURRENCE.—Low Isles, 1.ix.28, 6 specimens; 22.iii.29, 3 specimens; 17.iv.29, 1 specimen.

I have here figured the sphincters of 4 specimens, from all the samples, to show the similarity of the sphincters. The sphincters of three of the four specimens agree very well with one another, in as much as the muscle folds are shorter in the middle than in other parts, though the sphincter is very weak in the smallest specimen (Text-fig. 7), considerably stronger in the largest (Text-fig. 8), and intermediate in another (Text-fig. 9). Also the sphincter of the fourth specimen, collected 1.ix.28 (Text-fig. 10), differs little from the other sphincters.

I suggested previously that the species under discussion was *I. citrina* Hadd. & Shackl. (see Stephenson and others, 1931), but as the sphincter of this species shows an appearance unlike that of *citrina*, it is hardly possible to refer them to same species. Four specimens were examined as to the nematocysts; the larger specimens have slightly larger nematocysts than the smaller, but there is very little difference.

Isactinia lobata n. sp.

The pedal disc is wide, the column smooth; but owing to strong contraction it is transversely folded. At the margin is a ring of about 96 well-marked elongate pseudospherules, irregularly arranged. Uppermost part of column and outer part of oral disc strongly folded. Sphincter diffuse, but hardly indicated (Text-fig. 11), not as strong as the other endodermal muscles of the column. Circular muscles of the pseudospherules (p) very weak. Fosse distinct. The tentacles are rather short, up to about 400 in number, all of about the same length. Actinopharynx with numerous ridges, two siphonoglyphs not aborally prolonged. Many pairs of mesenteries perfect, 2 pairs of directires. Number of mesenteries at the base about half that of the tentacles. All stronger mesenteries, including the directives, fertile. Retractors of the strongest mesenteries band-like, those of the directives and the younger mesenteries somewhat restricted. Parietobasilar muscles distinct, on a fold of the mesentery. Nematocysts of the column $20.4-25.4 \times 2.4-2.8\mu$, numerous, basitrichs; those of the pseudospherules $19.7-26.8 \times 2.5-2.8\mu$, numerous, basitrichs; those of the tentacles $15.5-18.3 \times 2.5-3\mu$, numerous, basitrichs; those of the actinopharynx $18.3-22.6 \times 3-3.5\mu$, basitrichs; those of the filaments partly $18.3-21.1 \times 4.2\mu$, microbasic *p*-mastigophors, partly $26.8-29.6 \times 4.2\mu$, partly $21-24 \times 2.8\mu$, few, both basitrichs (also some small basitrichs about $10 \times 1.5\mu$).

COLOUR during life.—Disc and tentacles in the main brown, the tips of the tentacles pale green, the pale green colour perhaps affecting the shaft of the tentacle also to some extent (notes in a letter from Professor T. A. Stephenson).

SIZE in a very contracted condition.—Height 2 cm., diameter of pedal disc about 2.8 cm.

OCCURRENCE.—Low Isles, 9.xii.28, 1 specimen.

The uppermost part of the column and the outer part of the oral disc are thrown into 8 distinct lobes in the preserved specimen. Professor Stephenson has informed me that the tips of the tentacles were swollen into rounded knobs during life. In the preserved animal the tentacles are cylindrical and there are no indications of a "capitate" appear-

ance of the tentacles. The basitrichs of the tips of the tentacles are small, and agree in size with those of the lower parts of the tentacles. There are, thus, no large nematocysts present as in the case of capitate tentacles proper. According to Stephenson the tentacles were held over the disc in bunches so that they produced an unusual effect; they looked distinctly like the grape-like branches of the green alga, *Caulerpa racemosa*.

The species is closely related to *Isactinia* (*Anemonia*) *Kwoiam* (Hadd. & Shackl.), but I think that it is a distinct species, among other reasons because the appearance of the tentacles seems to be different.

Gyrostoma hertwigi Kwietniewski.

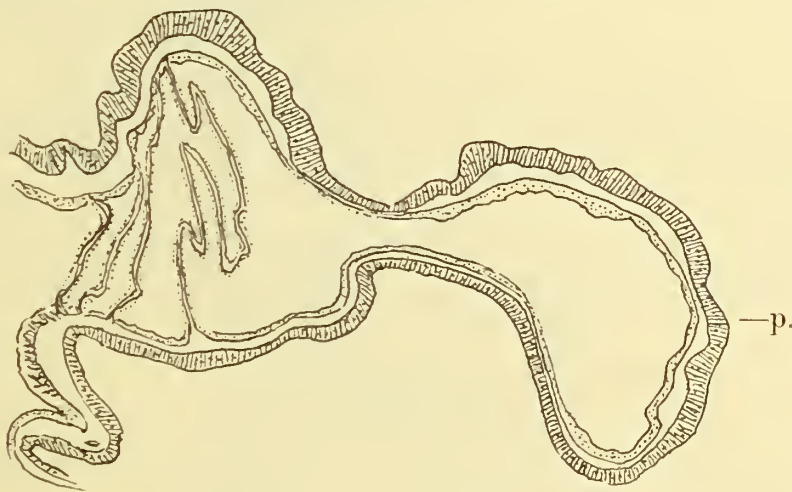
Gyrostoma hertwigi n. sp., Kwietniewski, 1897, p. 30; 1898, p. 424, pl. xxx, figs. 66–70.

Condylacis Ramsayi n. sp., Haddon and Shackleton, 1893, p. 124.

Anemonia ramsayi Hadd. & Shackl., Haddon, 1898, p. 420, pl. xxii, figs. 3, 4; pl. xxvi, figs. 6, 7.

Gyrostoma ramsayi, Stephenson and others, 1931, pp. 72, 87.

The pedal disc is wide, the column smooth, but owing to the strong contraction is transversely wrinkled. The fosse is well developed. Upper part of the column and outer

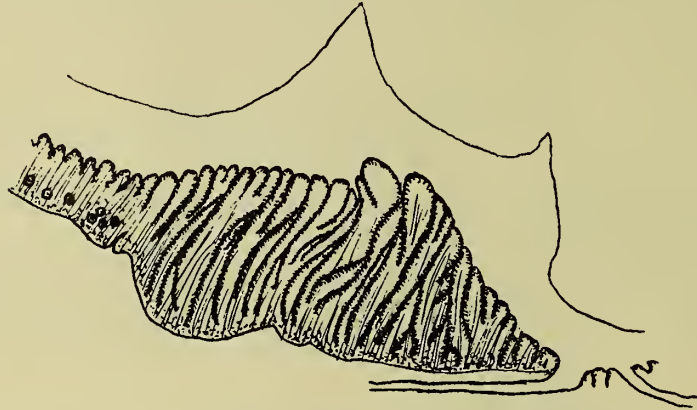


TEXT-FIG. 11.—Sphincter of *Isactinia lobata* n. sp.

part of the oral disc distinctly lobed. Sphincter diffuse, somewhat restricted. Text-fig. 12 shows a section of the sphincter which seems to agree very well with those drawn by Kwietniewski and Haddon in 1898. The tentacles are of moderate length, their longitudinal muscles ectodermal. The actinopharynx is folded. There are 7 siphonoglyphs corresponding to 7 pairs of directives in a specimen which was examined. A number of pairs of mesenteries are perfect. All stronger mesenteries, including the directives, seem to be fertile. The retractors are more or less band-like, as shown in the papers of Kwietniewski and Haddon. The parietobasilar muscles of the stronger mesenteries are situated on a distinct fold. The tentacles are more numerous than the mesenteries at the base, although it was difficult to determine the exact number of tentacles owing to their bladder-like appearance and the strong contraction of the oral disc. I counted about 140 mesenteries at the base and about 190–200 tentacles in one specimen; in another about 200 mesenteries and about 400 tentacles. Nematocysts of the column partly $22.6-28.2 \times 3.5-4.2\mu$, basitrichs, common, partly $39.5-46.5 \times 7-8\mu$, microbasic *p*-mastigophors,

scarce; those of the tentacles $19.7-28.2 \times 3.5-5.6\mu$, basitrichs, common; those of the actinopharynx partly $24-29.6 \times 7\mu$, microbasic *p*-mastigophors, scarce, partly $18.3-25.4 \times 3-3.5\mu$, common, partly $10.6-14 \times$ about 2μ , rare, both basitrichs; those of the filaments partly $21-31 \times 5-7\mu$, microbasic *p*-mastigophors, common, partly $22.6-25.4 \times 4-4.5\mu$, rare, partly $12-14 \times 2.8\mu$, both basitrichs.

COLOUR in the preserved condition.—Column brown, tentacles and oral disc greenish.



TEXT-FIG. 12.—Sphincter of *Gyrostoma hertwigi* Kwietniewski.

SIZE of the largest specimen in the contracted condition.—Height 3 cm., pedal disc 3.5 cm., oral disc 4 cm. According to Stephenson the species may reach more than 18 in. in diameter.

OCCURRENCE.—Three Isles, 6.v.1929, 3 specimens; Lizard Island (Stephensons, Tandy and Spender). Further distribution: Thursday Island, Murray Islands.

Fam. ACTINODENDRIDAE.

Actinodendron plumosum Hadd.

Actinodendron plumosum n. sp., Haddon, 1898, p. 490, pl. xxiv, figs. 3-6.

Actinodendron plumosum Hadd., Stephenson and others, 1931, pp. 44, 47, 50, 54, 55; Carlgren, 1945, p. 51.

Actinodendron arboreum (Quoy & Gaim.), Haddon & Shackleton, 1893, p. 117.

Actinodendron alcyonidium Saville-Kent, 1893, p. 34, 146, pl. xxii; 1897, p. 223, fig. p. 224.

The anatomy of this species agrees with that of *A. hansingorum* (Carlgren, 1900, p. 118). I have made sections of the smaller specimen. There are 2 very strong siphonoglyphs with well-developed aboral prolongations. The pairs of mesenteries are 24 (6 + 6 + 12), the retractors are band-like, and on the non-directives are often curved towards the exocoels. As to the nematocysts, see Carlgren, 1945, p. 15.

COLOUR in life.—Bright reddish brown, etc. (Stephenson). Stephenson and others, 1931, pl. xx, fig. 1, have given a good photograph of this species; see also Haddon and Saville-Kent.

SIZE of the larger specimen in the contracted condition.—Pedal disc 3.5 cm., height 6 cm.; of the smaller specimen: pedal disc 0.7 cm., height 4.5 cm.

OCCURRENCE.—Low Isles, 15.iv.29, 2 specimens. Further distribution: Torres Straits, Mer, Cape York and Lacapade Islands (W. Australia).

Possibly *plumosum* and *hansingorum* are indetical.

Fam. PHYMANTHIDAE.

Phymanthus muscosus Hadd. & Shackl.

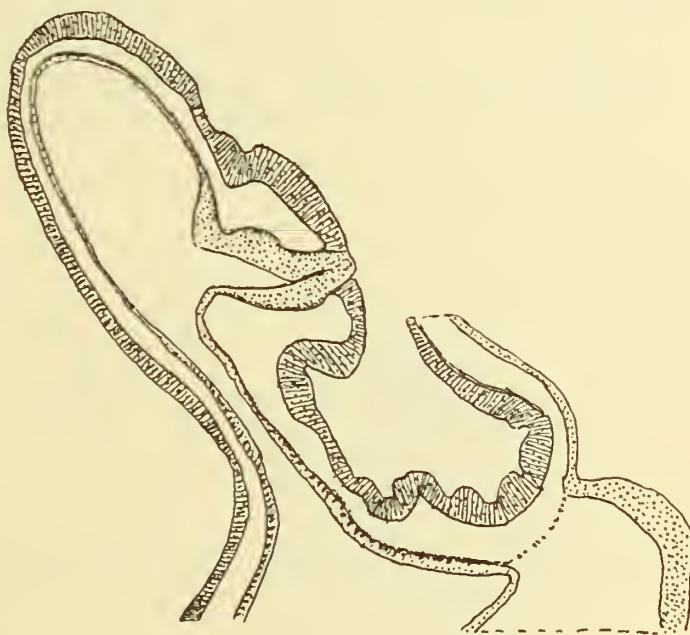
Phymanthus muscosus n. sp., Haddon and Shackleton, 1893, p. 122.

Phymanthus muscosus Saville-Kent, 1893, p. 149, Pl. iii, fig. 5.

Phymanthus muscosus Hadd. & Shackl., Haddon, 1898, pl. xxv, figs. 10-14; pl. xxxi, fig. 9.

Phymanthus sp. ? Carlgren, 1940, p. 35; Stephenson and others, 1931, p. 56.

There are three specimens in the collection, two of which are smaller than the third and probably not full-grown. I have identified them with *Phymanthus muscosus* Hadd. and Shackl. Haddon described the external features and certain anatomical details in 1898. All three specimens have perforated pseudospherules (Text-fig. 13) at the margin. There is no distinct sphincter. It is true that the endodermal muscles show short folds at the place where a sphincter usually occurs, but these folds are not stronger than those



TEXT-FIG. 13.—Pseudospherule of *Phymanthus muscosus* Haddon and Shackleton.

below the pseudospherules, the muscles of which are very weak. The marginal tentacles of the smaller specimens have fewer appendages than those of the large specimen, but even the appendages of the latter seem to be less strongly dendritic than in the type, probably owing to the degree of contraction. The marginal tentacles are about 96 in number, but there are half as many mesenteries at the base. The two siphonoglyphs are aborally prolonged. In one small specimen the mesenteries of the first and second cycles are perfect, in the large specimen at least a part of the third cycle also. In the small individual sectioned the mesenteries of the first cycle (apart from the two directives) are fertile; in the large specimen all mesenteries of the two first cycles are provided with reproductive organs. The retractors are strong, band-like, diffuse, with high folds, and on the directives are curved towards the endocoels, on the non-directives towards the exocoels. The parietobasilar muscles are well developed and set on a fold.

The nematocysts of the column are $12-19 \times 2-2.5\mu$, basitrichs; those of the pseudospherules $14-18.3 \times 2-2.5\mu$, basitrichs; those of the tentacles $13-20 \times 2.2-2.5\mu$, common,

basitrichs; those of the actinopharynx partly $13.4-24 \times 2.2-2.8\mu$, probably two sorts, basitrichs, partly $19-22.6 \times 4.2\mu$, microbasic *p*-mastigophors; those of the filaments partly $25.4-33.8 \times 3.5-4.5\mu$, partly $10-14.4 \times 2.2\mu$, both basitrichs, partly $17.6-22.6 \times (3) 4.2\mu$, microbasic *p*-mastigophors. All three specimens were examined for nematocysts.

COLOUR.—See Haddon and Shackleton, 1893; the preserved specimens are colourless.

SIZE of the larger specimen.—Oral disc 2.5 cm., height 2.5 cm. (the aboral part, however, is strongly contracted); of a smaller specimen: length about 3.2 cm., greatest diameter 1 cm.

OCCURRENCE.—Low Isles, 23.viii.28, 1 specimen; 21.iv.1929, 1 specimen; May 1929, 1 specimen. Further distribution: Torres Straits, Mer, Great Barrier Reef.

Heteranthus verruculatus Klunz.

Heteranthus verruculatus Klunzinger, 1877, p. 84, pl. v, fig. 9; Carlgren, 1900, p. 92; Stephenson, 1922, p. 290.

I have referred the single specimen with some hesitation to *verruculatus*, though the sphincter (Text-fig. 14) is somewhat stronger than in that species but of about the same



TEXT-FIG. 14.—Sphincter of *Heteranthus verruculatus* Klunzinger.

appearance. It is probably not identical with *H. insignis*, as the nematocysts of the column are considerably longer in that species than in *verruculatus* ($33.8-38\mu$ in the former, about $15.5-20\mu$ in the latter; unfortunately I have now no opportunity of examining the nematocysts of *verruculatus* in further detail). The verrucae are arranged in vertical rows; they are large, but smaller at the margin. The marginal tentacles are 96 ($12 + 12 + 24 + 48$) in number, short and conical, the close-set discal tentacles are papilliform. There are 2 siphonoglyphs and 2 pairs of directives. The retractors of the mesenteries are band-like, on the smaller mesenteries more restricted, the parietobasilar muscles form a distinct fold. As to the arrangement of gonads, I cannot give any information, as they are probably absent. The nematocysts of the tentacles are $14-17 \times$ about $2.2-2.5\mu$, basitrichs; those of the tentacles $14-19 \times 2.5-2.6\mu$, basitrichs, common; those of the

actinopharynx $20.4-24 \times$ about 3μ , basitrichs; those of the filaments partly $22.6-32.4 \times 3.5-4.2\mu$, partly $10-19.7 \times 1.5-2.5\mu$, both basitrichs, partly $14-22.6$ (26.8) \times about 4.2μ , microbasic *p*-mastigophors.

SIZE of the preserved specimen.—Length and diameter about 1 cm.

OCCURRENCE.—Low Isles or Snapper Island, 1 specimen, together with *Rhodactis bryoides*.

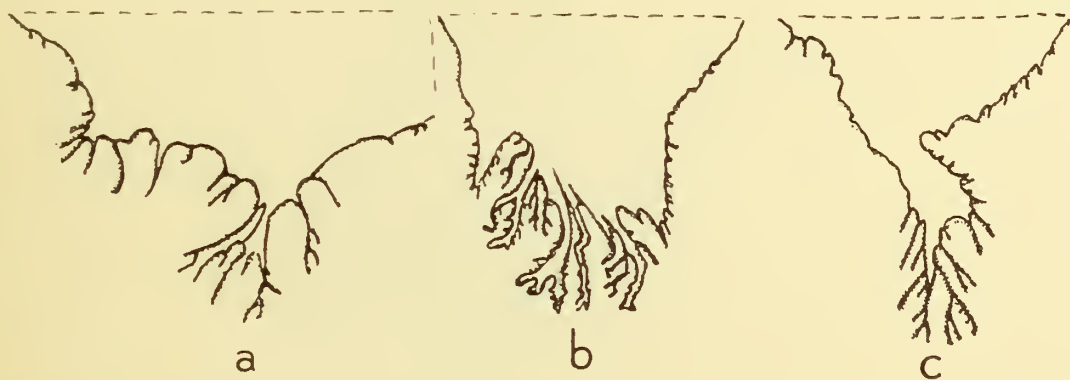
Fam. THALASSIANTHIDAE.

Heterodactyla Hemprichii Ehr.

Heterodactyla Hemprichii Ehrenberg, 1834, p. 266; Kwietniewski, 1896, p. 601; Haddon, 1898, p. 485; Carlgren, 1900, p. 114 (references); 1945, p. 14.

Thalassianthus Hemprichii Stephenson, 1922, p. 296; Stephenson and others, 1931, p. 47.

I described the anatomy of this species in 1900, and, in 1945 (p. 14), the cnidom of a species of *Heterodactyla* which I believe to be identical with *Hemprichii*. The sphincter is very weak in comparison to the size of the animal, and varies in appearance.



TEXT-FIG. 15.—Sphincters of *Heterodactyla Hemprichii* Ehrenberg. Specimens from (a) Low Isles, (b) Sumatra, and (c) Zanzibar.

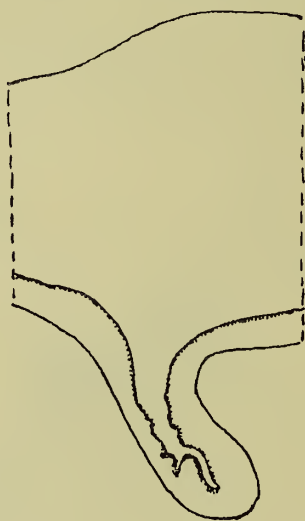
In Text-fig. 15 I have drawn the sphincters of specimens from Low Isles (a), Sumatra (b) and Zanzibar (c). Kwietniewski (1896) mentions that there was no sphincter in *Heterodactyla* from Ceylon. Probably he overlooked it owing to its small size. The nematocysts of the column were, in the specimen from Low Isles, $19.7-21 \times$ about $2.8-3\mu$, basitrichs; those of the nematospheres $34.5-41$ (45.2) $\times 2.8\mu$, basitrichs, numerous; those of the inner tentacles $35.2-39.5 \times 2.8\mu$, basitrichs; those of the actinopharynx $27.5-31 \times 3\mu$, basitrichs; those of the filaments partly $28.2-32.4 \times 2.8\mu$, partly $11.3-14 \times 1.5-2.2\mu$, both basitrichs, partly $28.2-31 \times 5-5.6\mu$, microbasic *p*-mastigophors. The sizes of the nematocysts agree rather well with those of a specimen from Sumatra (Carlgren, 1945, p. 14), but those of the inner tentacles are considerably larger in the present specimen; since, however, only traces of their ectoderm remain in the specimen from Sumatra, my information about the sizes of the nematocysts of the tentacles in that specimen is uncertain.

OCCURRENCE.—Low Isles, 1 specimen. Further distribution: Red Sea, Zanzibar, Ceylon?, Sumatra, tropical coast of Queensland from Torres Straits to Cape Flattery.

Cryptodendron adhaesivum Klunz.

Cryptodendron adhaesivum Klunzinger, 1877, p. 86, Pl. VI, fig. 4; Studer, 1878, p. 545; Kwietniewski, 1896, p. 600, pl. xxvi, fig. 15; Haddon & Shackleton, 1893, p. 117; Haddon, 1898, p. 483, pl. xxv, figs. 4-6, pl. xxxiii, figs. 5, 6; Stephenson, 1922, p. 296; Stephenson and others, 1931, p. 47; Carlgren, 1940, p. 32, fig. 9, 13.

Kwietniewski (1896) has given notes on the anatomy of this species, Haddon (1898) figures of the sphincter, and Carlgren (1940) information about the cnidom of a specimen from Billeton. The column of the present specimen and that from Billeton is provided with suckers in its upper part. The sphincter was, in Haddon's and Studer's specimens, rather well developed, though small in comparison with the size of the animal, and of somewhat different structure. The sphincter of the present specimen is very weak and consists only of a thin muscle lamella (Text-fig. 16) projecting from the column, though the corona of the animal is 6 cm. across. Owing to the variable appearance of the sphincter Haddon



TEXT-FIG. 16.—Sphincter of *Cryptodendron adhaesivum* Klunzinger.

suggests that the different specimens described as *adhaesivum* may be different species, but as weak sphincters often vary in appearance there is no reason to keep the individuals apart even though their colour also varies.

The aboral prolongations of the siphonoglyphs are well developed. Three cycles of mesenteries seem to be perfect. The nematocysts of the column of the present specimen are $19.7\text{--}22.6 \times 2.8\mu$, basitrichs, numerous; those of the inner tentacles partly $15.5\text{--}29.6 \times 2.2\text{--}2.5\mu$, basitrichs, partly $32.4\text{--}43.7 \times 4.2\text{--}5.6\mu$, microbasic *p*-mastigophors; those of the nematospheres $29.6\text{--}36.7 \times 2\text{--}2.5$ (2.8) μ , basitrichs, numerous; those of the outer tentacles partly $16.2\text{--}26.8 \times 2\text{--}2.5$ (2.8) μ , basitrichs, partly $38\text{--}42 \times 5.6\mu$, microgasic *p*-mastigophors; those of the actinopharynx $25.4\text{--}32.4 \times 2.8\mu$, basitrichs (besides a few basitrichs $18.3\text{--}19.7 \times 2.8\mu$); those of the filaments partly $25.4\text{--}29 \times (2.5)$ 3μ , partly $17\text{--}19.7 \times 2.5\mu$, few, both basitrichs, partly $31\text{--}35.2 \times$ about 5.6μ , microbasic *p*-mastigophors. The nematocysts of this specimen agree well with those of the specimen from Mindanao (Cargren, 1940), only the basitrichs of the inner tentacles are larger in the present example. It may, however, be noted that the ectoderm of the tentacles of the specimen from Billeton had fallen away to a considerable extent.

OCCURRENCE.—Low Isles, 1 specimen. Further distribution: The Red Sea, Zanzibar, coast of Salvatti, New Guinea, Billeton, Mindanao, Torres Straits, Murray Islands.

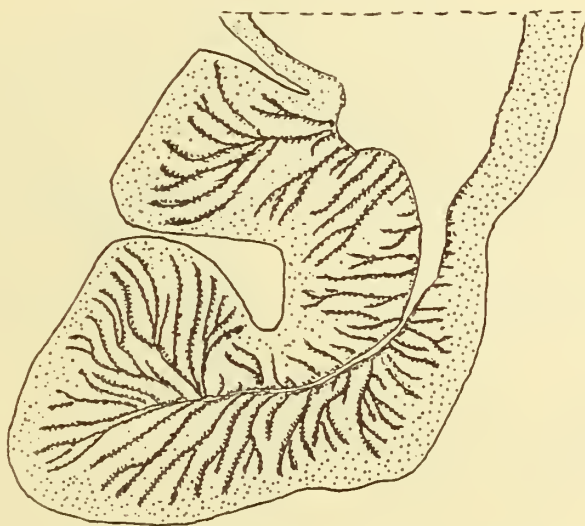
Fam. STOICHACTIIDAE.

Stoichactis kenti (Hadd. & Shackl.).

Discosoma kenti Haddon & Shackleton, 1893, p. 119; Saville-Kent, 1893, p. 144, chromo pl. I; 1897, p. 219, pl. xxxix B (*D. Haddoni*).

Stoichactis kenti Haddon, 1898, p. 473, pl. ,xxxi figs. 6, 7; Stephenson and others, 1931, pp. 38, 44, 47, 49, 50, 54, 72, pl. x, fig. 1; Stephenson, 1946, pl. vi.

The sphincter of a large specimen agrees very well with that figured by Haddon (1898, plate xxxi, fig. 6, 7). Haddon mentions that the sphincter has a tendency to divide into two branches. In a specimen sectioned by me from Southport, Queensland,



TEXT-FIG. 17.—*Stoichactis kenti* (Haddon and Shackleton). Sphincter of a specimen from Southport, Queensland.

the sphincter was considerably (almost 3 times) stronger and distinctly divided into two branches (Text-fig. 17). The anatomy of this species and the following is very similar, but it seems that *kenti* should have microbasic *p*-mastigophors in the ectoderm of the column while they are absent in *haddoni*. My material of the two species is, however, insufficient to decide the validity of this suggestion. The nematocysts of the column are partly $14.8-18.3 \times 2.5-2.8\mu$, basitrichs, partly $24-25.4 \times 4.2-5.6\mu$, microbasic *p*-mastigophors; those of the tentacles $26.8-33.8 \times 2.8-3\mu$, basitrichs; those of the actinopharynx $25.4-31 \times 3.5 (4\mu)$, basitrichs; those of the filaments partly $25.4-28.5 \times 3.5\mu$, basitrichs, partly $29.6-35.2 \times 5.6-6.3\mu$, microbasic *p*-mastigophors.

COLOUR.—A large specimen painted from life by Stephenson (1946, plate vi) had prussian blue tentacles.

OCCURRENCE.—Low Isles, 2.ix.28, 1 large specimen. Further distribution: from Torres Straits southwards to Mackay; on the Western Australia coasts as far south as Sharks Bay (Haddon); Southport, Queensland.

Stoichactis haddoni (Sav.-Kent).

Discosoma haddoni Saville-Kent, 1893, p. 32, 145, photo pl. xxi, chromo. pl. ii; 1897, p. 221.

Stoichactis haddoni Haddon, 1898, p. 474, pl. xxxi, fig. 8.

The sphincter of the single specimen is much weaker than that of *kenti*, and of similar appearance to that figured by Haddon (1898, plate xxxi, fig. 8). The nematocysts of the column are $12.7-15.5 \times (2.2) 2.5\mu$, basitrichs; those of the tentacles $23.3-32.4 \times 2.8-3.5\mu$, basitrichs; those of the actinopharynx $21.1-28.2 (32.9) \times 3-4\mu$, basitrichs; those of the filaments partly $22.6-29.6 \times$ about 3μ , numerous, partly $12.7-16.9 \times$ about 2.2μ , few, both basitrichs, partly $26.8-32.4 \times$ about 5.6μ . See also under *S. kenti*.

COLOUR.—Two small specimens were green (Stephenson).

OCCURRENCE.—Low Isles, 22.iii.29, 1 specimen; 2.ix.28, 2 small specimens. Further distribution: about the same as that of *S. kenti*.

Fam. HORMATHIIDAE.

Hormathianthus tuberculatus Carlgr.

Hormathianthus tuberculatus n. sp., Carlgren, 1943, pl. ii, figs. 3-6, text-figs. 23, 24.

? *Hormathia andersoni* n. sp., Haddon, 1888, p. 125, pl. xx.

? *Chitonanthus andersoni* Hadd., Haddon, 1898, p. 460.

The specimen agrees with the type, but the basitrichs of the acontia are here somewhat larger, $31-35 \times 3-3.5\mu$.

OCCURRENCE.—Penguin Channel, 14 fms., 1 specimen. Further distribution: Bay of Nhatrang, S. Annam, Ream, Cambodja, Paulo Condore, ? Mergui Archipelago.

Calliactis miriam (Hadd. & Shackl.).

Adamsia miriam n. sp., Haddon and Shackleton, 1893, p. 130.

Calliactis miriam (H. & S.), Haddon, 1898, p. 457, pl. xxiii, fig. 25; Stephenson and others, 1931, p. 72.

Haddon and Shackleton described the external features of this species in 1893. The sphincter is strong, distinctly stratified transversely, about the same in appearance as the sphincter of *C. polypus* (Cargren, 1928, p. 198, Text-fig. 37). The tentacles of the largest specimen are about 300 or more, and very closely set. The longitudinal muscles of the tentacles and radial muscles of the oral disc are ectodermal. There are 2 siphonoglyphs and two pairs of directives. Six pairs of mesenteries are perfect and sterile, the imperfect ones are fertile. The muscles of the mesenteries are weak. The nematocysts of the column are $5.6-7 \times 1.5-2.5\mu$, basitrichs; those of the tentacles $17.7-25.4 \times 2.2-2.5\mu$, numerous, basitrichs; those of the actinopharynx $16.2-21.1 \times 2.5-2.8\mu$, basitrichs; those of the filaments partly $17-21 \times$ about 4.2μ , microbasic *p*-mastigophors, partly $9.2-11.3 \times 2.8\mu$ basitrichs; those of the acontia $17-22.6 \times 2.8-3\mu$, basitrichs. These nematocysts were measured from a specimen from the Great Barrier Reef; those of the tentacles and acontia also from an individual from Low Isles.

COLOUR in the preserved condition.—On some specimens there are traces of the patches which are present in the type. The patches are here greenish grey. Traces of banding on some of the tentacles are visible.

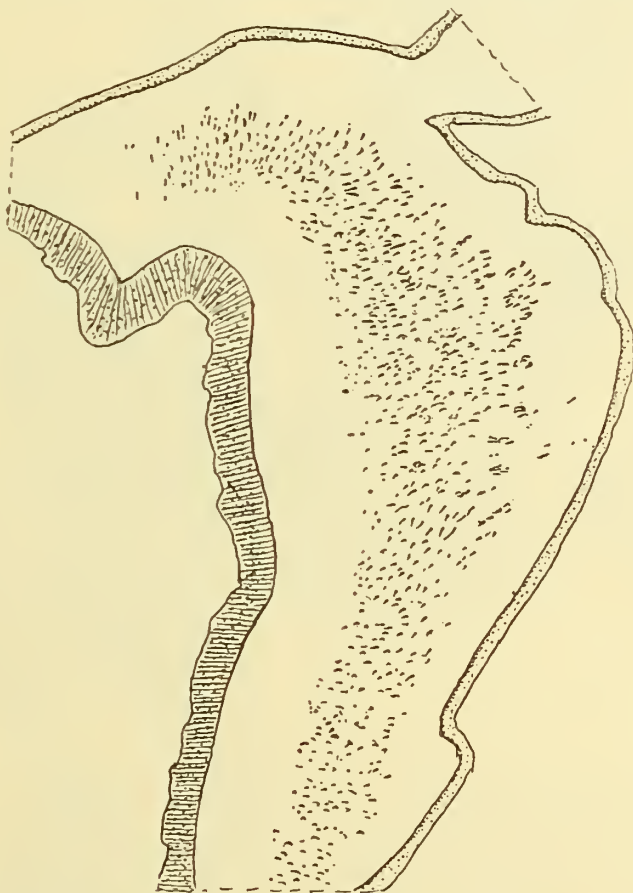
SIZE of the largest specimen in the preserved condition.—Height 2 cm., diameter of the very extended pedal disc 3.5×2.5 cm.

OCCURRENCE.—Probably Low Isles, on shell of *Dolium*, with hermit, 4 specimens. Outer Barrier Reef, 4.vi.29, 2 specimens on shell of conch with hermit. Further distribution : Torres Straits, Mer.

Fam. ISOPHELLIIDAE.

Telmatactis stephensoni n. sp.

Column divisible into a long scapus and a short scapulus, the former with a cuticle. Sphincter very long, alveolar, with small meshes, broad in its upper part, where it is set in the middle of the mesogloea, diminishing downwards and here approaching the endo-



TEXT-FIG. 18.—Upper part of sphincter of *Telmatactis stephensoni* n. sp.

derm, but always wholly separated from the endodermal muscles of the column. The lower part of the sphincter recalls in its appearance that of *Telmatactis* (*Phellia*) *vermiformis* (see plate xxvii, fig. 10, in Haddon's paper of 1898). Tentacles, 74, arranged (according to Stephenson) $6 + 6 + 12 + 24 + 26$, those of the fifth cycle developed only between those of the second and third cycles, except that in one section there were two additional tentacles, making 26 in the fifth cycle altogether, instead of the theoretical 24. Apices of the tentacles knobbed and, in the preserved condition, longitudinally furrowed.

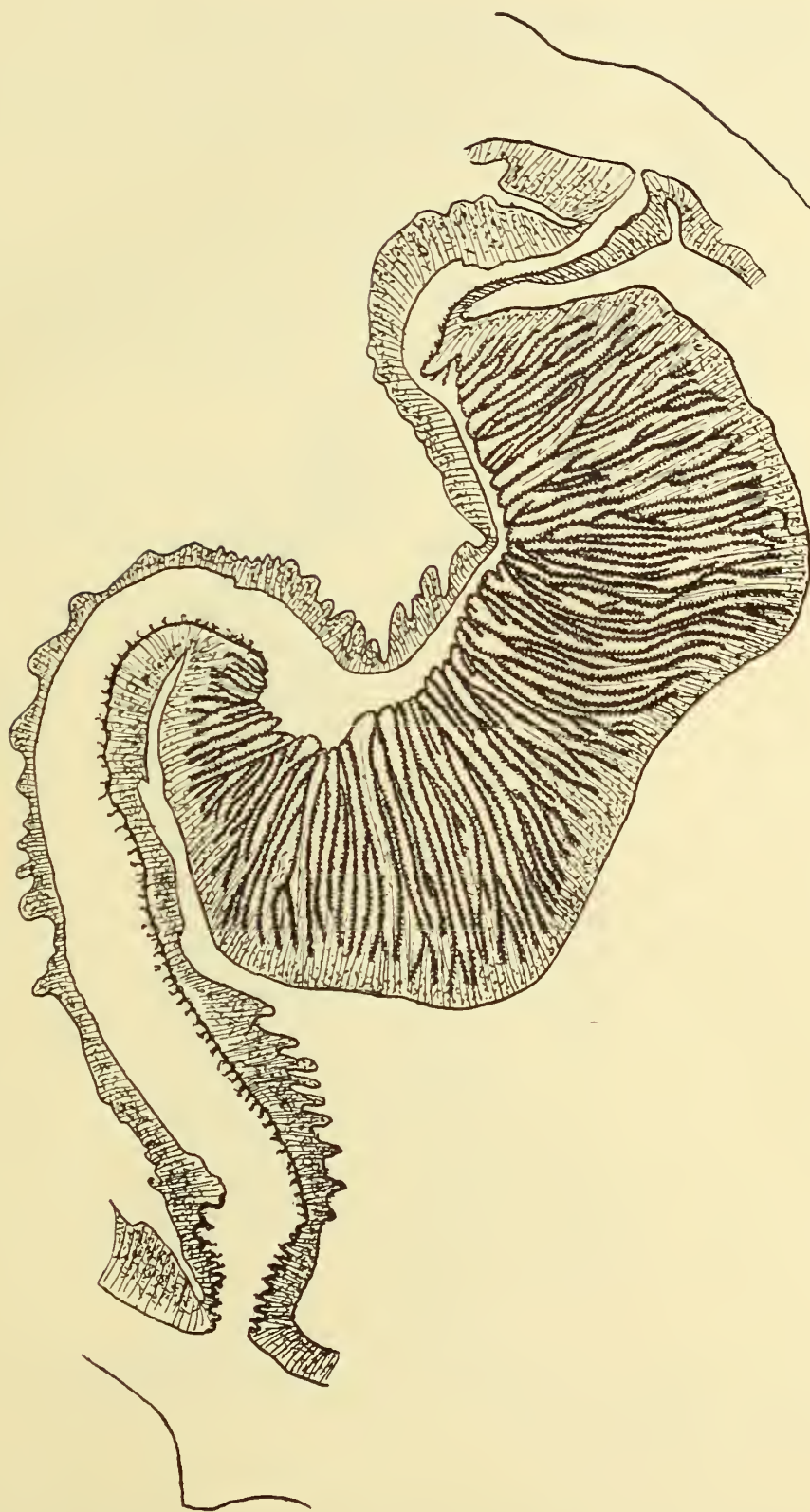
Actinopharynx ridged, with two siphonoglyphs, which are not strongly marked. Pairs of mesenteries, 37 ($6 + 6 + 12 + 13$) corresponding to the arrangement of the tentacles, so that the mesenteries of the fourth cycle are lacking on either side of those of the first cycle, except in one sector, where they are present. The mesenteries of the fourth cycle are provided, at least in some cases, with a short filament. Only the mesenteries of the first cycle are perfect and fertile, those of the first to third cycles are provided with filaments and acontia. Whether the acontia show an arrangement similar to that found in *T. panamensis* is difficult to decide, as they are very numerous and plaited together; but



TEXT-FIG. 19.

it is possible that they are attached to the mesenteries along the filaments. Only the first cycle of mesenteries have retractors, which are more or less restricted and form high folds branched at the end. The retractors of the directives are particularly strongly restricted and almost circumscribed (as in plate xxviii, fig. 11, in Haddon's paper of 1898). The nematocysts of the apices of the tentacles are $57.8-69 \times$ about 2.8μ , basitrichs, very numerous, close set; those of the actinopharynx partly $22.6-26.8 \times 4.2-5\mu$, microbasic *p*-mastigophors, partly $26.8-31 \times$ about 2.8μ , basitrichs, partly $43.7-48 \times 7-8.5\mu$, probably microbasic amastigophors, perhaps not belonging to the actinopharynx; those of the filaments partly $14.1-16.9 \times 3.5-4.2\mu$, microbasic *p*-mastigophors, partly $11.3-14.8 \times$ about $1.5-2\mu$, basitrichs; those of the acontia partly $50-56.4 \times$ about 10μ , microbasic amastigophors, partly $21.1-24 \times 2.5-2.8\mu$.

COLOUR.—Knobs of tentacles yellowish red, their shafts banded; disc and tentacles with a remarkably complex, bilaterally symmetrical pattern, the directive axis also being



TEXT-FIG. 20.

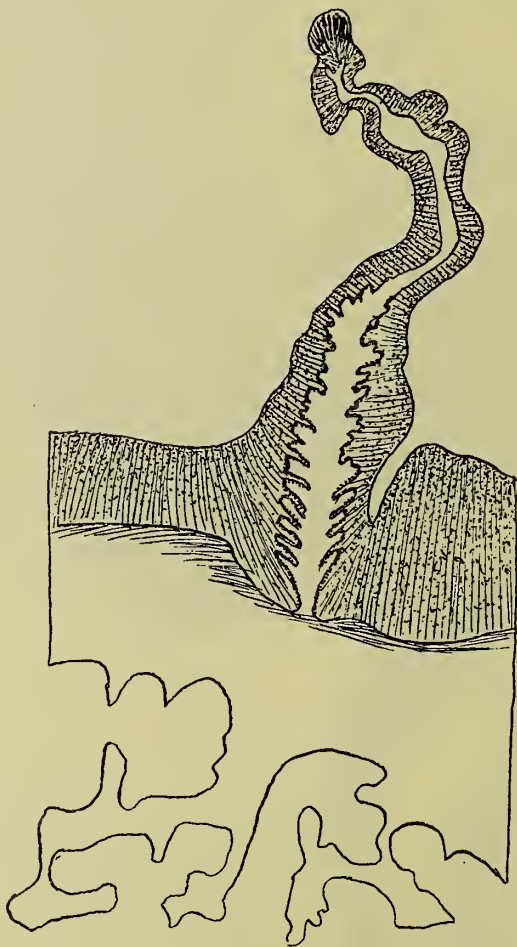
indicated by special markings. A coloured figure of the disc and tentacles, accompanied by explanatory diagrams, is given by Stephenson (1947, plate iv).

SIZE of the very contracted specimen.—Length 2.8 cm., diameter 2.5 cm.

OCCURRENCE.—Low Isles, from the interstices of branching coral, 1 specimen. In Text-fig. 18 I have drawn the upper part of sphincter. The species recalls *T. vermiformis*, but the colour is quite different.

Telmatactis australiensis n. sp.

Column as in the preceding species. Tentacles 50, hexamerously arranged, $6 + 6 + 12 + 24 + 2$, tips longitudinally sulcated, probably knobbed, shafts transversely folded. Sphincter recalling that of *T. stephensoni* but not so long, in the lower part not so sharply separated from the endodermal muscles of the column (Text-fig. 19). Pairs of mesenteries



TEXT-FIG. 21.

TEXT-FIGS. 19-21—*Telmatactis australiensis* n. sp. 19. Lower part of sphincter. 20. Transverse section of mesentery of first cycle at level of lower part of actinopharynx. 21. Mesentery of second cycle.

$6 + 6 + 12 (+ 1)$, probably in the uppermost part of the column, where there are 3 small, close-set tentacles). Only the first cycle are perfect and provided with strong, very restricted, almost kidney-like retractors (Text-fig. 20; transverse section of a mesentery of the first cycle at the level of the lower part of the actinopharynx). The mesenteries

of the second cycle have filaments and longitudinal muscles on both sides of the mesenteries (Text-fig. 21). The nematocysts of the tips of the tentacles are partly $55-65 \times 2.5-2.8\mu$, basitrichs, numerous, very close set, partly $32.4-36.7 \times$ about 4.2μ , microbasic *p*-mastigophors?; those of the actinopharynx partly $26.8-33 \times$ about 2.8μ , basitrichs, partly $39.5-49.3 \times$ about 7.7μ , probably microbasic amastigophors; those of the filaments partly $14-15.5 \times 3.5-4.2\mu$, microbasic *p*-mastigophors, partly $12.7-15.5 \times$ about 1.5 , basitrichs, few; those of the acontia partly $45-56.5 \times 8.5-10$ (11.3) μ , microbasic amastigophors, partly $19.7-24 \times 2.2\mu$, basitrichs.

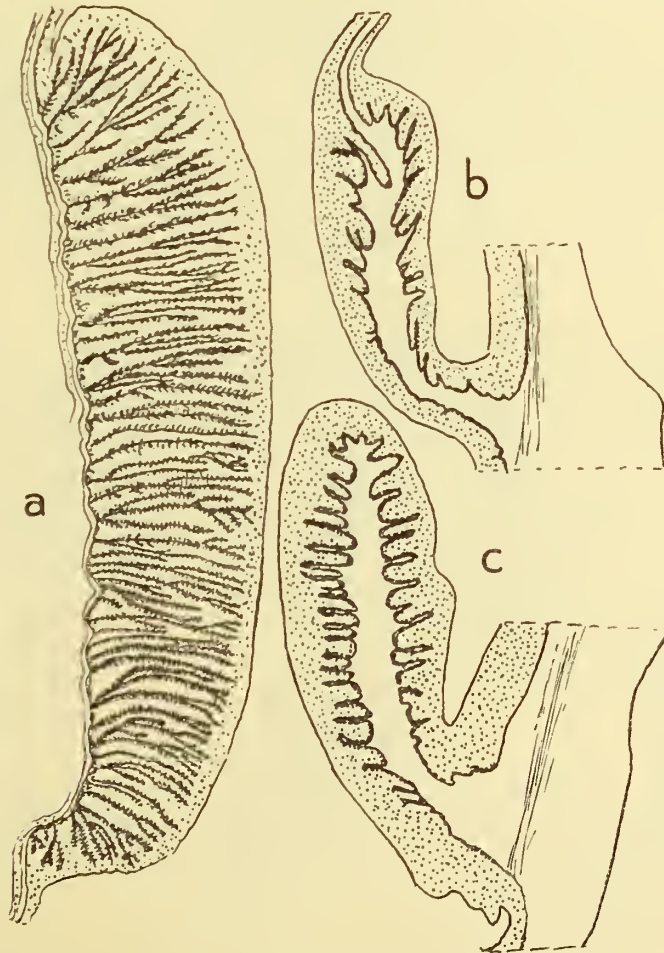
COLOUR.—Unknown.

SIZE.—Length 1.3 cm., breadth 1.1 cm. (Body very contracted.)

OCCURRENCE.—Three Isles, anchorage, 4.v.29, 1 specimen.

Telmatactis insignis n. sp.

Column divisible into scapus and scapulus, the former provided with a thin cuticle. Sphincter very long, reticular in its uppermost part; lower down it consists of only a few meshes, and in its lower part it increases considerably in thickness and is situated near



TEXT-FIG. 22.—*Telmatactis insignis* n. sp. (a) Retractor in the region of the actinopharynx. (b) Parietal part of perfect mesentery immediately below the actinopharynx. (c) Mesentery of the second cycle from the same region as (b).

the endoderm. (A section of the sphincter in the lower part recalls that of *T. (Phellia) vermiformis* (Haddon).) The tentacles are 48 in number, short, indistinctly sulcated at their distal ends, but not knobbed; their longitudinal muscles are ectodermal and well developed. The actinopharynx has high longitudinal folds. There are 2 siphonoglyphs and 24 pairs of mesenteries (6 + 6 + 12 pairs). Only the mesenteries of the first cycle are perfect, but at least those of the second cycle are provided with filaments and acontia. The retractors are diffuse but somewhat restricted below the actinopharynx, forming high, close-set and branched folds. The parietal muscles are weak, as also are the muscles of the mesenteries of the second and even more those of the third cycles. The single specimen is sterile. The nematocysts of the tentacles are partly $46.5-51 \times 2.5-2.8\mu$, basitrichs, very numerous, partly $28.2 \times 5\mu$, probably microbasic amastigophors, very rare; those of the actinopharynx partly $22.6-28 \times 2.8\mu$, partly $13-14 \times 1.5\mu$, both basitrichs, partly $22.6-28.2 \times 4.2-5\mu$, microbasic *p*-mastigophors, partly $33.8-43.7 \times 6.3-8.5\mu$, probably microbasic amastigophors; those of the filaments partly $11.3-14 \times (3.5) 4.2\mu$ ($.24 \times 5\mu$), microbasic *p*-mastigophors, partly $11.3-14 \times 1.5-2\mu$, basitrichs; those of the acontia partly $47.2-57.8 \times 10-11.3$ (12.7) μ , microbasic amastigophors, partly $19.7-23.4 \times$ about 2.5μ , basitrichs.

SIZE.—Length 2 cm., breadth 1 cm.

OCCURRENCE.—Low Isles, 18.viii.28, 1 specimen.

I have drawn figures of a retractor (Text-fig. 22a) in the region of the actinopharynx, of the parietal part of a perfect mesentery (Text-fig. 22b) and of a mesentery of the second cycle (Text-fig. 22c), both the latter sections taken immediately below the actinopharynx.

Genus *Epiphellia*.

Epiphellia n. gen., Carlgren, 1949, p. 89.

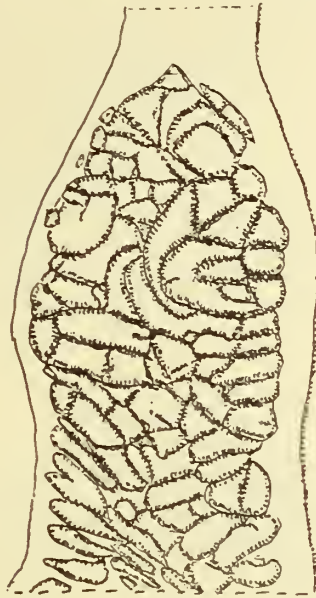
Isophelliidae with small base. Column elongate, divisible into scapus and scapulus, the former with tenaculi, probably without cinclides. Sphincter mesogloeal, elongate, usually strong. Longitudinal muscles of tentacles and radial muscles of oral disc ectodermal. Two distinct siphonoglyphs and two pairs of directives. No more mesenteries distally than proximally. Six pairs of macrocnemes, microcnemes recalling the parietal part of the macrocnemes. Retractors of the macrocnemes strongly restricted to circumscribed, very strong. Parietal muscles of the microcnemes, which may be provided with filaments and acontia, strong. Cnidom: spirocysts, basitrichs, microbasic *p*-mastigophors, microbasic amastigophors.

GENOTYPE.—*E. anneae* sp. n.

E. anneae n. sp.

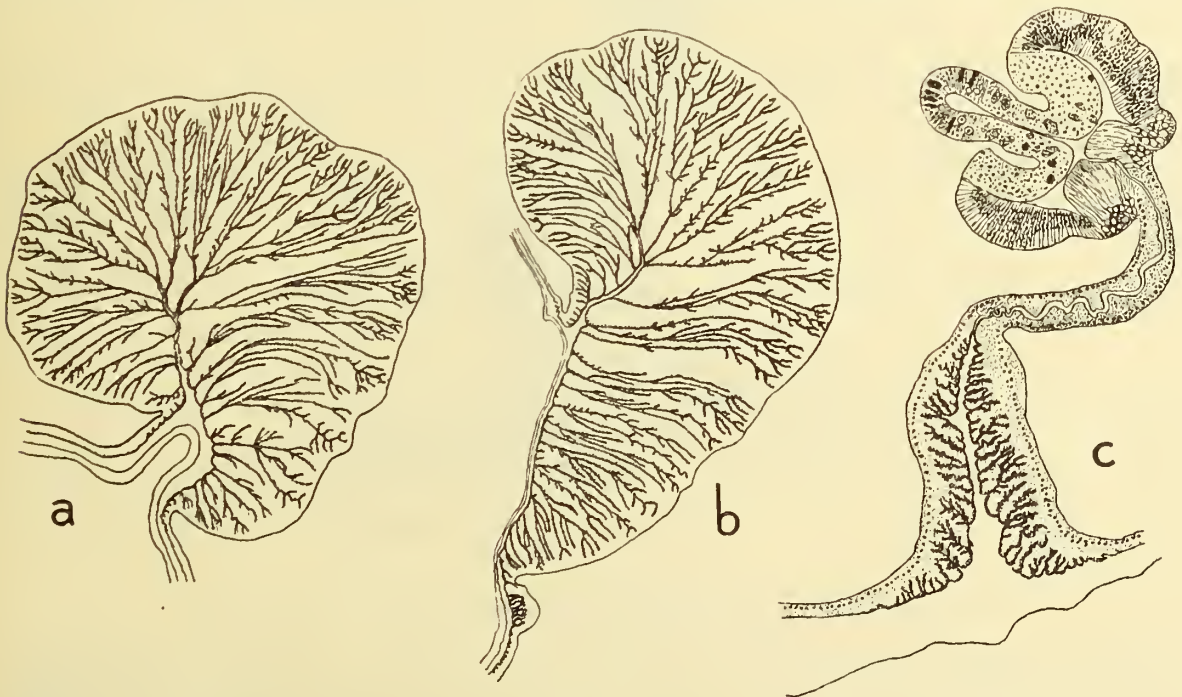
Pedal disc small. Column divisible into a long scapus and a short scapulus. Scapus provided with tenaculi to which grains of sand may be attached. Sphincter long, reticular in its upper part, alveolar in its lower. Tentacles 48 (6 + 6 + 12 + 24), not knobbed at their tips, their longitudinal muscles ectodermal. Actinopharynx ridged. Two distinct siphonoglyphs and two pairs of directives. Six pairs of macrocnemes, the "*Edwardsia*" mesenteries stronger than the other macrocnemes in the sense that they are considerably longer. The retractors of the macrocnemes are very strong and more or less circumscribed, forming very fine and long branched folds. The 18 pairs of microcnemes lack retractors

but their muscles are well developed, elongate and branched, and recall the parietal muscles of the macrocnemes. All mesenteries have filaments and acontia. The nemato-



TEXT-FIG. 23.—Uppermost part of sphincter of *Epiphellia anneae* n. sp.

cysts of the column are $14-21 \times 2.8\mu$, basitrichs; those of the tentacles partly $14-16.2 \times 2.8\mu$, partly $26.8-38.8 \times$ about 2.8μ , both basitrichs; those of the actinopharynx partly $12.7-15.5 \times 1.5\mu$, partly $25.4-35.2 \times 2.8\mu$, both basitrichs, partly $28.2-31 \times 3.5-4\mu$,



TEXT-FIG. 24.—*Epiphellia anneae* n. sp. (a) Cross section of retractor muscle of a directive mesentery. (b) Cross section of retractor muscle of a non-directive mesentery. (c) Section of mesentery of the third cycle.

microbasic *p*-mastigophors, partly $43.7-50.8 \times 7-9\mu$, common, probably microbasic amastigophors; those of the filaments $16.9-19.7 \times 3.5-4.2\mu$, microbasic *p*-mastigophors; those of the actonia partly $53.6-65 \times 7-8\mu$, common, microbasic amastigophors, partly $19-25.4 \times 2.5-2.8\mu$, common, basitrichs.

Size of the single specimen.—Length about 6.5 cm., greatest diameter about 1 cm.

Occurrence.—Low Isles, 2.ix.28, 1 specimen.

The sphincter is elongate and extends some distance into the scapus. It is broad and reticular in its uppermost part (Text-fig. 23), but diminishes downwards where it forms a thin streak near the ectoderm; still further down it approaches the endoderm and at the same time becomes somewhat broader. The folds of the retractors are very delicate. In Text-fig. 24 I have drawn cross-sections of two retractors, (a) from a directive mesentery and (b) from a non-directive. The figure also (c) shows a section of a mesentery of the third cycle.

E. elongata n. sp.

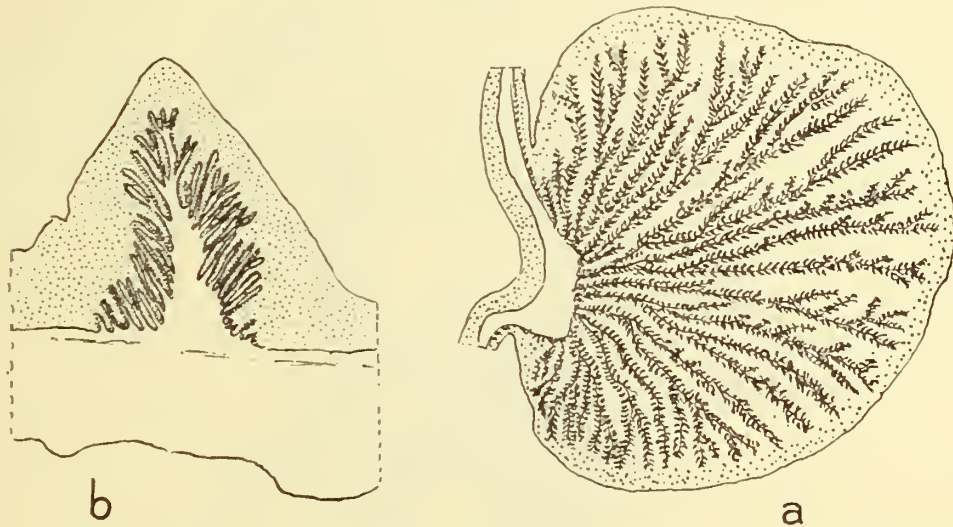
Pedal disc small. Column elongate, divisible into scapus and scapulus, the former provided with tenaculi. Sphincter mesogloéal, reticular in its uppermost part, alveolar in its lower part, forming a thin streak near the ectoderm; considerably shorter than



TEXT-FIG. 25.—Uppermost part of sphincter of *Epiphellia elongata* n. sp.

that of *E. anaeae* but extending a little way into the scapus. Tentacles of the larger specimen about 30 in number, rather short; longitudinal muscles of tentacles and radial muscles of oral disc ectodermal. Actinopharynx long, with 2 distinct siphonoglyphs. Six pairs of macrocnemes, 2 pairs of which are directives; six pairs of microcnemes belong-

ing to the second cycle. The third cycle is represented only by 4 pairs of microcnemes and two single (unpaired) microcnemes; the four pairs are situated in the lateral and dorso-lateral primary exocoels ventral to second-cycle pairs; the two single mesenteries occupy a similar position in the ventro-lateral exocoels. The "*Edwardsia*" macrocnemes have longer filaments and are somewhat stronger than the other macrocnemes. The retractors of the macrocnemes are circumscribed and richly branched, the parietal muscles form high and somewhat branched folds. The mesenteries of the second cycle have exceptionally small filaments and acontia. The nematocysts of the tentacles are $26.8-35.2 \times 2.2-2.8\mu$, very common, basitrichs; those of the actinopharynx partly $24.7-28.2 \times 2.8\mu$, partly about $11 \times 1.4\mu$, very rare, both basitrichs, partly $28.2-31 \times 5-5.6\mu$, microbasic *p*-mastigophors; those of the filaments partly $15.5-18.3 \times 3.5-4\mu$, microbasic



TEXT-FIG. 26.—*Epiphellia elongata* n. sp. (a) Cross section of retractor muscle. (b) Cross section of mesentery of the second cycle.

p-mastigophors, partly about $8.5 \times 1.4\mu$, very rare, basitrichs; those of the acontia partly $45-56.4$ (65) $\times 7.8-9.2\mu$, microbasic amastigophors, partly $15.5-19.7 \times 2.2-2.5\mu$, basitrichs.

SIZE of larger specimen.—Length about 3 cm., greatest diameter about 0.6 cm.; of the smaller specimen: length 1.3 cm., diameter up to 0.4 cm.

OCCURRENCE.—Low Isles, 10.iv.29, 2 specimens.

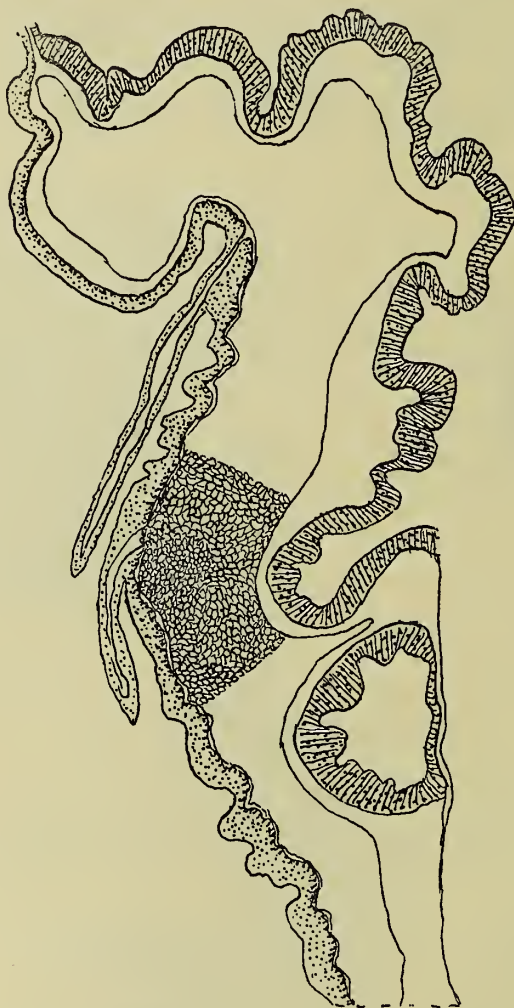
The scapus is provided with a thin cuticle, considerably thickened on the tenaculi. Text-fig. 25 shows a section of the uppermost part of the sphincter, Text-fig. 26 a section of a retractor, and Text-fig. 26b a section of a mesentery of the second cycle. The specimen examined is a male.

Fam. SAGARTIIDAE.

Anthothoë australiensis n. sp.

The pedal disc is very extensive, on a shell with hermit. The column is smooth, the sphincter very strong, reticular and separated from the endodermal muscles of the column by a very thin strip of mesogloea. In Text-fig. 27 I have drawn the sphincter (only a part of the reticulum is figured, but the inner line shows the distribution of the sphincter).

The tentacles are moderately long and numerous. I counted 130 in one half of a specimen. The longitudinal muscles of the tentacles are ectodermal. There are 2 well-developed siphonoglyphs, regularly placed, in the one individual; in the other one only. The gonidial tubercles are well developed. The actinopharynx has 20–22 longitudinal ridges. There are two directive pairs or only one. In the typical specimen 12 perfect and sterile mesenteries are present, the mesenteries of the third and fourth cycles are provided with testes. The retractors are diffuse and very weak. The mesenteries at the margin are



TEXT-FIG. 27.—Sphincter of *Anthothoe australiensis* n. sp.

seemingly more numerous than at the base. The nematocysts of the column are partly $12-17 \times 2.2-2.8\mu$, basitrichs, partly $17.6-21 \times 4\mu$, often a little curved, probably basitrichs; those of the tentacles partly $32.4-36.7 \times$ about 3μ , common, partly $14.8-17 \times 1.5-2.2\mu$, rather common, both basitrichs; those of the actinopharynx partly $17-22.6 \times 2-2.5\mu$, basitrichs, partly $31-36.7 (42) \times 4.5 (5.6) \mu$, microbasic *p*-mastigophors, those of the filaments partly $8.5 \times 1.5\mu$, few, partly $7.8-10 \times 2.8-3\mu$, common, fusiform, microbasic *p*-mastigophors, partly $26.8-31 \times 4.2-5.6\mu$, common, microbasic amastigophors?, those of the acontia partly $56.4-65 \times 7-7.5\mu$ ($67.7-77.6 \times 8.5\mu$, probably development stages), microbasic amastigophors, partly $11.3-14.1 \times 2.2-2.5\mu$, basitrichs.

Size of largest specimen.—Height 1.2 cm., diameter of the very wide pedal disc 4.5×3.5 cm.

OCCURRENCE.—Batt Reef, 2.viii.28, 2 specimens on shell with hermit.

It is possible that the species is identical with *Sagartia Milmanni* (Hadd. & Shackl.) described by Haddon, 1898, p. 449, but as there are no notes about the colour of the present species, and the types and size of the nematocysts in *Milmanni* are unknown, I have preferred to erect a new species for it.

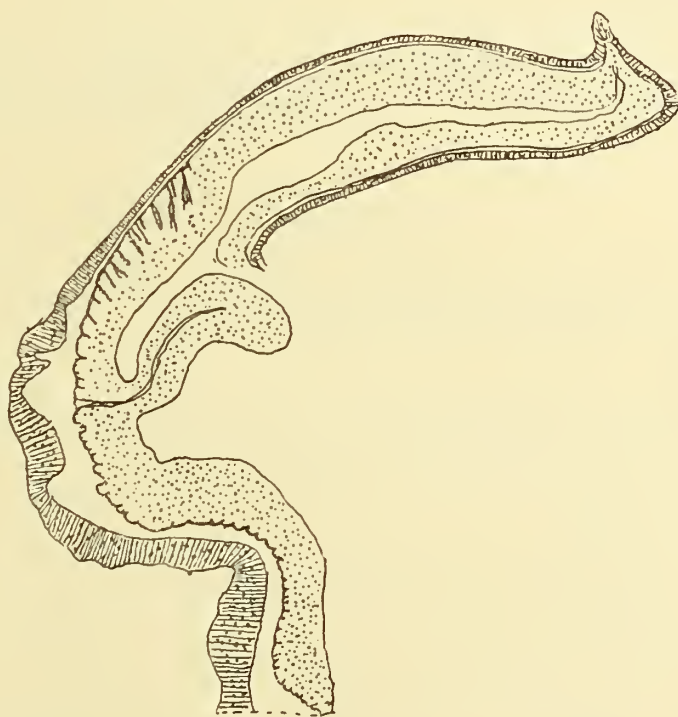
CORALLIMORPHARIA.

Fam. RHODACTIIDAE.

Rhodactis Howesii Sav.-Kent.

Rhodactis Howesii Saville-Kent, 1893, p. 150, chromo. pl. iii, fig. 2, a-c; Haddon, 1898, p. 478.

I have identified the single specimen with *Rhodactis Howesii*. The marginal tentacles are well developed. Round about the mouth there are some simple or little branched tentacles. The other discal tentacles are branched, and in the inner part of the oral



TEXT-FIG. 28.—Sphincter of *Rhodactis Howesii* Sav.-Kent.

disc they are sparsely set, in the other parts closely arranged and richly branched. The number of branches varies, but many tentacles have up to about 20 branches. Near the margin there is a more or less naked zone as in *R. indosinensis*. The sphincter (Text-fig. 28) is somewhat weaker than that of the latter species. The nematocysts of the column are partly $22.6-25.4 \times 9.2-10\mu$, microbasic *p*-mastigophors, partly $18.3-21 \times 5.6-7\mu$, microbasic *b*-mastigophors, partly $35.2-42.3 \times 11.3-15.5\mu$, holotrichs; those of the marginal

tentacles partly $22-35 \times 4.2-5.6\mu$, atrichs, rare, partly $21-26.8 \times 5.6-8.5\mu$, microbasic *p*-mastigophors, partly $15.5-19.7 \times 4.2-5.6\mu$, microbasic *b*-mastigophors, partly $35.2-42.3 \times 15.3-17\mu$, partly $91.6-105.7 \times 42.3-48\mu$, both holotrichs, in the endoderm; those of the discal tentacles $22.6-24 \times$ about 7μ , few, microbasic *p*-mastigophors; those of the actinopharynx $36.7-42.3 \times 14-17\mu$, holotrichs; those of the filaments partly $35.2-42.3 \times$ about $8.5-9.2\mu$, microbasic *p*-mastigophors, partly $159-177 \times 53.6-56\mu$, partly $35.2-36.7 \times 15.5-17\mu$, both holotrichs.

COLOUR.—See Saville-Kent. The preserved specimen is brownish.

SIZE in the contracted condition.—Height 1.2 cm., diameter of pedal disc 4×2 cm., that of oral disc 3×2.2 cm.

OCCURRENCE.—Low Isles, western moat, 1 specimen; Cleveland Bay, near Townsville, Queensland (Saville-Kent).

Rhodactis bryoides Hadd. & Shackl.

Rhodactis bryoides n. sp., Haddon and Shackleton, 1893, p. 121; Carlgren, 1943, p. 16, fig. 8a.

Actinotryx bryoides (Hadd. & Shackl.), Haddon, 1898, p. 479, pl. xxv, figs. 1-3, pl. xxxii, figs. 7-9; Stephenson, 1922, p. 306.

OCCURRENCE.—Low Isles or Snapper Island, several specimens. Further distribution: S. Annam, Bay of Nhatrang, Paulo Condore, Torres Straits, Murray Islands.

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